

FINAL

A meeting of the NEPOOL Participants Committee was held via teleconference beginning at 10:00 a.m. on Friday, February 2, 2018, pursuant to notice duly given. A quorum determined in accordance with the Second Restated NEPOOL Agreement was present and acting throughout the meeting. Attachment 1 identifies the members, alternates and temporary alternates who participated in the teleconference meeting.

Mr. Thomas Kaslow, Chair, presided and Mr. David Doot, Secretary, recorded.

APPROVAL OF JANUARY 5, 2018 MEETING MINUTES

Mr. Kaslow referred the Committee to the preliminary minutes for the January 5, 2018 meeting as circulated in advance of the meeting. Following motion duly made and seconded, the preliminary minutes of the January 5 meeting were unanimously approved without change.

CONSENT AGENDA

Mr. Kaslow referred the Committee to the Consent Agenda that was circulated in advance of the meeting. Following motion duly made and seconded, the Consent Agenda was unanimously approved without discussion or comment.

ISO CEO REPORT

Mr. Gordon van Welie, ISO Chief Executive Officer (CEO), referred the Committee to the summaries of the ISO Board and Board Committee meetings that had occurred since the January 5 meeting, which had been circulated and posted in advance of the meeting. There were no questions or comments on the summaries.

Mr. van Welie then provided an update on the ISO's lessons learned during the recent cold weather period, the fuel security study and planned stakeholder process, and the ISO's planned response to the FERC order seeking comments on grid resilience. He summarized the ISO's concerns with the resilience of the system during recent cold weather (i.e., the ability to withstand

major contingencies), which he said the ISO would reinforce in its response to FERC. He said the ISO planned to raise and discuss with its stakeholders a number of questions and concerns with the region's fuel security risks. He expressed concern that the ISO was faced with managing system constraints not otherwise visible to the marketplace, reflected in pricing or for which there were appropriate communication structures, highlighted by the ISO's efforts to maintain a 3-day fuel reserve on the system during the recent cold weather period. He expressed concern also that, as oil reserves dropped during that second week of cold weather, the scarcity value of that oil was not reflected in generator offers and prices for oil-fired generation did not trend up, as they should have, towards the prices for gas-fired generation. He said the experiences during this last cold snap reinforced challenges with the fuel supply chain. He opined that, if the region had in fact concluded to live with the constraints on the gas pipelines, it must have more robust incentives for advanced arrangements to resupply fuel tanks during the winter, especially during adverse weather conditions when the risk of disrupted fuel supply is most acute.

Turning to the Fuel Security Analysis, Mr. van Welie made the following points:

- Risks associated with operations during cold weather are increasing;
- As non-natural gas fired resource retirements continue, the region is becoming more reliant on liquefied natural gas (LNG) and dual-fuel resources;
- Retirements can be accommodated with more replacement energy from resources that do not require fossil fuel and from demand reduction;
- The region's policymakers are encouraging reduction in fossil fuel-fired generation resources, but there is concern that retirements of such resources will occur more quickly than suitable replacement resources are added to the system; and
- Certain key energy resources are critical to fuel security.

He reviewed two parallel tracks for addressing fuel security issues: (1) market design changes (to better reflect fuel constraints in pricing and to incent market participants to make forward fuel arrangements and to invest in infrastructure when appropriate); and (2) infrastructure investments to relieve fuel constraints. As to the latter, he said the ISO did not have jurisdiction over fuel

infrastructure and could not direct investments to relieve fuel constraints. As to the market design track, he flagged the following ISO questions:

- Is the pay-for-performance (PFP) payment rate and stop-loss provision properly calibrated, particularly if the region must depend on large quantities of imported LNG?
- How can the market design enhance incentives for forward fuel supply and re-supply arrangements?
- How can market design be improved to ensure that generators can reflect in their offers the opportunity costs associated with scarce fuels and scarce emission allowances?

He said the ISO planned to begin discussing with stakeholders possible market design improvements in the second quarter of 2018 and expected those efforts would take approximately a year to conclude.

Mr. van Welie discussed the ISO's plans for responding to the FERC's January 8 grid resilience order. He said the ISO's responses would focus on the fuel security issues as the region's largest resilience issue. The ISO also would raise its longer-term operations concerns in the face of increasing reliance on intermittent resources. He noted the increasing reliance especially during very cold conditions, to have available fuel, with little relief in sight until there are storage technologies that can carry the region through a season. While New England had electric storage technologies that could sustain operations during hours or even a day, the region needed storage that could help satisfy loads for longer-term, sustained periods of time to ride through extended coldweather or other events. The market design challenges (to ensure fuel security) were complicated and, to his knowledge, had not yet been solved anywhere in the world. He explained the ISO would make these points with the FERC and he urged NEPOOL and the States to support the ISO's request for adequate time to work through these issues.

Mr. van Welie then concluded his remarks with a summary of the January 23, 2018 hearings of the U.S. Senate Committee on Energy & Natural Resources on the performance of the

electric power systems during cold weather. He identified who testified with him on the panel and reported that his introductory remarks had been circulated by the ISO in advance of the hearings. In response to senators' questions, he explained that New England could not get natural gas pipelines built because (1) there was no customer willing and able to commit to pay for that pipeline, and (2) there was considerable resistance in New England and New York to new pipeline infrastructure. Also responding to senators' questions, he noted that New England must import LNG from Russia and elsewhere because the Jones Act prohibits transfer of LNG from one U.S. port to another U.S. port. He said he reinforced that the Market Participant and the states, and not the ISO, must decide what infrastructure investments will be made to ensure fuel supply. He noted the comments of Senator King of Maine that New England would need to rely on multiple solutions to ensure continued reliable, cost-effective energy supply. He reported that Committee Chair Lisa Murkowski underscored with FERC Chairman McIntyre Congress' sense of urgency. Mr. van Welie's worry was that timing pressures might encourage the FERC to act ahead of New England proposing responsive improvements to its markets, or limit the time available to submit proposals to the FERC. He again urged members and the States to support the ISO's request that the FERC allow the region sufficient opportunity and time to address its resilience concerns.

The ISO then noted Chair Murkowski's opinion that New England was a potential harbinger for other parts of the country. Based on her read of the Fuel Security Analysis, she noted that New England was confronted with a choice to use load shedding or infrastructure investment to manage reliability. Also reported was the FERC Chairman's observation that the system performed reasonably well under stressed conditions with high wholesale prices and better coordination between electric and gas system operators than in the past. He also reportedly cited New England's Winter Reliability Program and talked of the need more broadly for capacity market reforms, enhanced performance incentives, and a common understanding of resilience.

In response to Participants Committee members' questions on his remarks, Mr. van Welie clarified that two forms of seasonal storage were fossil fuel (LNG or oil) in a tank and large hydro impoundments such as the Hydro-Québec (HQ) dams. He affirmed that the ISO would not have a Winter Reliability Program in place for Winter 2018-19, but the region did need to discuss whether other market improvements beyond PFP might be needed to provide assurance of continued, adequate fuel supply. He stated the ISO did not plan to change PFP for Winter 2018-19, but would watch market reactions closely, and as needed discuss, for example, whether the payment rate was sufficient to encourage necessary investment and behavior. He noted that, in 2013 when designing PFP, the ISO saw dual-fuel as the most cost effective way to offset the pipeline constraints. The ISO needed to reassess that conclusion given experiences this past winter, when gas was very expensive, the local distribution companies and not the generators were buying market gas and were not using their own local LNG storage, and most of the energy coming from generators was coming from oil-fueled units or gas-fired units switching to oil. Clarifying his remarks on market design concerns, he explained the ISO wanted to ensure pricing that encourages the use of available gas on the system and furthermore, to provide incentives to make adequate resupply arrangements. The ISO also wanted to reconsider whether the PFP stop-loss provisions would be adequate if the outcome were rolling blackouts due to inadequate fuel supply arrangements.

Mr. van Welie clarified that the ISO maintained a reliable power system during the cold snap, but not one that could have handled any additional major contingencies, particularly after Pilgrim was forced down. Dr. Vamsi Chadalavada further clarified the region did not lose energy from Pilgrim until the night of January 4, closer to the end of the cold snap. Mr. van Welie added by way of example (and reference to one of the contingencies studied in the Operational Fuel Security Analysis) that the energy output of Everett to the electric system during the two-week

cold period was the energy equivalent of burning 600,000 barrels of oil and the loss of Everett could have put New England in an untenable position during this period.

ISO COO REPORT

Dr. Chadalavada, ISO Chief Operating Officer (COO), referred to the February COO report, the previous report on the cold weather period and accompanying questions and answers, and an update on the oil inventory levels in New England, each of which were circulated in advance of the meeting and posted on the NEPOOL and ISO websites. He said the February COO report reflected data through January 24, 2018. During that time: (i) Energy Market value was \$1.1 billion, up \$285 million from December 2017 and \$684 million from January 2017; (ii) average natural gas prices were 77% higher than average prices in December 2017; (iii) average Real-Time Hub LMPs (\$119.14/MWh) were 49% higher than December 2017 LMPs; (iv) average daily (peak hour) Day-Ahead cleared physical Energy, as a percent of forecasted load, was 98.9% in January, down from 99.2% in December 2017; and (v) daily Net Commitment Period Compensation (NCPC) for January (based on data through January 24, 2018) totaled \$19.6 million, up \$12.6 million from December 2017 and up \$15.2 million from January 2017. January NCPC, which was 1.7% of total Energy Market value, was comprised of (a) \$17.9 million in first contingency payments, which were up \$12.5 million from December, and (b) \$1.6 million in second contingency payments, which were up \$1.1 million from December.

He then referred to a chart showing that the amount of usable oil in New England, which began the winter at 68% of maximum inventory, was down to almost 19% by January 9. He said replenishments since then had increased inventory back up to 35% of maximum storage.

In response to a member's question, Dr. Chadalavada agreed that reporting on average physical load that cleared the Day-Ahead Energy Market did mask peaks and valleys, and the ISO would consider ways to highlight that in future reports. He opined that, given current 10-

day forecasts of moderate temperatures, the ISO considered fuel inventory to be sufficient, and that the energy consumption generally decreases as days grow longer.

Comparing the Winter 2017-18 cold snap to the 2013-14 cold snap, Dr. Chadalavada said the system performed better because of market enhancements, Day-Ahead replacement reserves, and strong performance from many older oil units. He explained that, had the ISO not postured units during the last three days of the cold snap, there was a good chance that the region would have run out of oil that Saturday and potentially through Tuesday when warmer weather arrived. Mr. van Welie noted as an aside that the ISO's experiences during the two-week cold snap were very close to the conditions assumed in the reference case for the fuel security study, reinforcing the usefulness of that study in identifying future challenges for the region.

Noting earlier comments on the availability of gas on the system for the right price, Dr. Chadalavada observed that the ISO had committed close to 2,000 MW of supplemental gas units on the final Saturday of the cold snap and all those units were able to procure gas. He expressed, at least as a question whether more gas might have been consumed instead of oil had prices reflected oil scarcity. He explained that the ISO did not have a reliable means to identify actual gas consumption versus gas availability, whereas it did have that type of data for oil usage. He explained that the ISO would be researching data to better understand the gas supply issues during the cold snap. Mr. van Welie observed that the Fuel Security Study reference case assumed one billion cubic feet (Bcf) of LNG injection used for gas generation, when the actual experience was that very little of the LNG was used for that purpose. He noted also that energy from HQ was not capacity-backed for the most part and HQ warned Day-Ahead of the possibility of reductions in imports. That reduction was modeled Day-Ahead but did not materialize in Real-Time, which raised an inference that the ISO was overcommitting the system. He explained the ISO needed to operate a system with margins to maintain reliability.

Mr. Kaslow thanked Dr. Chadalavada for his report and for his response to all the questions, which reinforced the need for further discussion of the Fuel Security Analysis with stakeholders.

LITIGATION REPORT

Mr. Doot referred the Committee to the January 31 Litigation Report and to the summary of the filings submitted in January in the Competitive Auctions with Sponsored Policy Resources (CASPR) proceeding (ER18-619) which accompanied that Report, that had been circulated and posted in advance of the meeting. . Referring to the Clear River Energy complaint seeking changes to Schedule 11 of the Open Access Transmission Tariff and related Tariff provisions that address cost recovery for operating and maintenance associated with large generator interconnection-related network upgrades, he reported that Clear River withdrew its complaint following the pleadings and some developments in its Rhode Island case. He reported on a pending complaint filed by Calpine and LS Power regarding the market structure implications of having a delayed resource continue to be treated as an existing resource in subsequent years, and the fact that the FERC had still not acted on that complaint. He also referenced the contested ISO filing to terminate a capacity supply obligation (CSO). He reported that the FERC was asked to rule on that quickly so that the ISO could settle the upcoming forward capacity auction with the right MWs of existing resources. He reported that, just prior to the meeting, the DC Circuit Court of Appeals remanded the FERC's decisions to allow the 7-year price lock-in and capacity-carry-forward rules, finding that the FERC did not justify changing its conclusions about appropriate treatment for such resources.

COMMITTEE REPORTS

Mr. William Fowler reported that the Markets Committee meeting originally scheduled for February 6-7 was cancelled for lack of business items.

Mr. Robert Stein reported that the Reliability Committee was scheduled to meet on February 13 and would start a process for reviewing what assumptions for determining Installed Capacity Requirements (ICR) should be evaluated and possibly changed for FCA13 and hopefully for FCA14.

Mr. Jose Rotger reported that the Transmission Committee meeting scheduled for February 27 was cancelled. He stated the Transmission Committee would likely schedule extra meetings in April/May to review Tariff changes arising out of the ongoing RNS/LNS formula rate settlement proceeding.

Mr. Kenneth Dell Orto reported that the Budget & Finance Subcommittee was scheduled to meet on February 9 to review the ISO's quarterly capital projects report filing, to receive a summary of NEPOOL year-end financial results, and review proposed FCM-related clean up changes to definitions used in the Financial Assurance Policy.

OTHER BUSINESS

Mr. Kaslow reported that the March 2 Participants Committee meeting was scheduled to be held in-person at the Hilton Logan Airport Hotel in Boston, MA. He stated that the ISO would be reviewing at the meeting, for NEPOOL's comment and reaction, more details on its intended filing in the FERC grid resilience docket.

There being no further business, the meeting adjourned at 11:17 a.m.

Respectfully submitted,

David T. Doot, Secretary

**PARTICIPANTS COMMITTEE MEMBERS AND ALTERNATES
PARTICIPATING IN
FEBRUARY 2, 2018 TELECONFERENCE MEETING**

PARTICIPANT NAME	SECTOR/ GROUP	MEMBER NAME	ALTERNATE NAME	PROXY
AR Small Load Response (LR) Group Member	AR-LR	Doug Hurley	Brad Swalwell	
AR Small Renewable Generation (RG) Group Member	AR-RG	Erik Abend		
Ashburnham Municipal Light Plant	Publicly Owned		Brian Thomson	
Associated Industries of Massachusetts	End User			Roger Borghesani
AVANGRID: CMP/UI	Transmission	Eric Stinneford	Alan Trotta	
Belmont Municipal Light Department	Publicly Owned		Dave Cavanaugh	
Block Island Power Company	Supplier	Dave Cavanaugh		
Boylston Municipal Light Department	Publicly Owned		Brian Thomson	
BP Energy Company	Supplier			Nancy Chafetz
Braintree Electric Light Department	Publicly Owned			Dave Cavanaugh
Calpine Energy Services, LP	Supplier	John Flumerfelt	Brett Kruse	Bill Fowler
Chester Municipal Light Department	Publicly Owned		Dave Cavanaugh	
Chicopee Municipal Lighting Plant	Publicly Owned		Brian Thomson	
CLEARresult Consulting, Inc.	AR-DG	Doug Hurley		
Competitive Energy Services, LLC	Supplier			Glenn Poole
Concord Municipal Light Plant	Publicly Owned		Dave Cavanaugh	
Connecticut Municipal Electric Energy Coop. (CMEEC)	Publicly Owned	Brian Forshaw		
Conservation Law Foundation	End User	David Ismay		
Consolidated Edison Energy, Inc. (ConEd)	Supplier	Jeff Dannels		
CPV Towantic, LLC	Generation	Dan Pierpont		
Cross-Sound Cable Company (CSC)	Supplier		Jose Rotger	
Danvers Electric Division	Publicly Owned		Dave Cavanaugh	
Direct Energy Business, LLC	Supplier			Nancy Chafetz
Dominion Energy Generation Marketing, Inc.	Generation	Michael Purdie	Jim Davis	
DTE Energy Trading, Inc.	Supplier			Nancy Chafetz
Dynergy Marketing and Trade, LLC	Supplier			Bill Fowler
Emera Maine	Transmission	Lisa Martin		
Emera Energy Services	Transmission	Sandi Hennequin		Bill Fowler
ENGIE Energy Marketing NA, Inc.	Generation	Joe Dalton		
Entergy Nuclear Power Marketing, LLC	Generation	Ken Dell Orto		Bill Fowler
Environmental Defense Fund	End User	Liz Delaney		
Eversource Energy	Transmission		Cal Bowie	
Exelon Generation Company	Supplier	Steve Kirk	Bill Fowler	
FirstLight Power Resources Management	Generation	Tom Kaslow		
Galt Power, Inc.	Supplier	Nancy Chafetz		
Generation Group Member	Generation		Abby Krich	Bob Stein
Georgetown Municipal Light Department	Publicly Owned		Dave Cavanaugh	
Great River Hydro, LLC	AR-RG			Bill Fowler
Groton Electric Light Department	Publicly Owned		Brian Thomson	
Groveland Electric Light Department	Publicly Owned		Dave Cavanaugh	
H.Q. Energy Services (U.S.) Inc.	Supplier		Bob Stein	Abby Krich
Harvard Dedicated Energy Limited	End User		Mike Macrae	Roger Borghesani; Paul Peterson; Doug Hurley
High Liner Foods (USA) Incorporated	End User		William P. Short III	
Hingham Municipal Lighting Plant	Publicly Owned		Dave Cavanaugh	
Holden Municipal Light Department	Publicly Owned		Brian Thomson	
Holyoke Gas & Electric Department	Publicly Owned		Brian Thomson	
Hull Municipal Lighting Plant	Publicly Owned		Brian Thomson	
Ipswich Municipal Light Department	Publicly Owned		Brian Thomson	

**PARTICIPANTS COMMITTEE MEMBERS AND ALTERNATES
PARTICIPATING IN
FEBRUARY 2, 2018 TELECONFERENCE MEETING**

PARTICIPANT NAME	SECTOR/ GROUP	MEMBER NAME	ALTERNATE NAME	PROXY
Littleton (MA) Electric Light and Waster Department	Publicly Owned		Dave Cavanaugh	
Long Island Lighting Company (LIPA)	Supplier		William Killgoar	
Maine Power LLC	Provisional Member	Jeff Jones		
Mansfield Municipal Electric Department	Publicly Owned		Brian Thomson	
Marblehead Municipal Light Department	Publicly Owned		Brian Thomson	
Massachusetts Attorney General's Office (MA AG)	End User	Fred Plett	Christina Belew	
Mass. Municipal Wholesale Electric Company	Publicly Owned	Brian Thomson		
Mercuria Energy America, Inc.	Supplier			Nancy Chafetz
Merrimac Municipal Light Department	Publicly Owned		Dave Cavanaugh	
Middleborough Gas & Electric Department	Publicly Owned		Brian Thomson	
Middleton Municipal Electric Department	Publicly Owned		Dave Cavanaugh	
National Grid	Transmission		Tim Martin	
Nautilus Power, LLC	Generation		Bill Fowler	
New Hampshire Electric Cooperative (NHEC)	Publicly Owned			Brian Forshaw
New Hampshire Office of Consumer Advocate (NH OCA)	End User	Paul Peterson		
NextEra Energy Resources, LLC	Generation	Michelle Gardner		
NRG Power Marketing LLC	Generation		Pete Fuller	
Pascoag Utility District	Publicly Owned		Dave Cavanaugh	
Paxton Municipal Light Department	Publicly Owned		Brian Thomson	
Peabody Municipal Light Department	Publicly Owned		Brian Thomson	
PowerOptions, Inc.	End User	Cindy Arcate		
Princeton Municipal Light Department	Publicly Owned		Brian Thomson	
PSEG Energy Resources & Trade LLC	Supplier	Joel Gordon		
Reading Municipal Light Department	Publicly Owned			Brian Forshaw
Repsol Energy North America Company	Gas Industry Part.		Nancy Chafetz	
Rowley Municipal Lighting Plant	Publicly Owned		Dave Cavanaugh	
Russell Municipal Light Dept.	Publicly Owned		Brian Thomson	
Shipyard Brewing LLC	End User		Stacy Dimou	
Shrewsbury Electric & Cable Operations	Publicly Owned		Brian Thomson	
South Hadley Electric Light Department	Publicly Owned		Brian Thomson	
Sterling Municipal Electric Light Department	Publicly Owned		Brian Thomson	
Stowe Electric Department	Publicly Owned		Dave Cavanaugh	
Taunton Municipal Lighting Plant	Publicly Owned		Dave Cavanaugh	
Templeton Municipal Lighting Plant	Publicly Owned		Brian Thomson	
The Energy Consortium	End User	Roger Borghesani		Paul Peterson, Fred Plett Doug Hurley
Utility Services Inc.	End User			Paul Peterson
Vermont Electric Power Company	Transmission	Frank Ettori		
Vermont Energy Investment Corporation	AR-LR		Doug Hurley	
Vermont Public Power Supply Authority	Publicly Owned			Brian Forshaw
Verso Energy Services LLC	Generation	Glenn Poole		
Wakefield Municipal Gas & Light Department	Publicly Owned		Brian Thomson	
Wallingford DPU Electric Division	Publicly Owned		Dave Cavanaugh	
Wellesley Municipal Light Plant	Publicly Owned		Dave Cavanaugh	
West Boylston Municipal Lighting Plant	Publicly Owned		Brian Thomson	
Westfield Gas & Electric Department	Publicly Owned		Dave Cavanaugh	
Wheelabrator North Andover Inc.	AR-RG	Bill Fowler		